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Competition within the data centre sector is rife and, arguably, is what drives continual improvement. However, where this adversarial stance hasn't proved advantageous is in dealing with the ongoing skills shortage and promoting the data centre to young people as a career option.

The good news is that things are beginning to change thanks to the University Technical College (UTC) Heathrow – a science, technology, engineering and mathematics (STEM) focused school for students aged 14-19. Here, the Digital Futures programme is training young people as engineers to build out the digital highways that enable the world to communicate securely, and at speed. In this issue CNet Training's Andrew Stevens charts the story of UTC Heathrow and how breaking down barriers and collaboration has produced an industry game changer.

On a different note, given that the last 25 years or so have been dominated by the need for bigger and better copper cabling, the appetite for faster twisted pair based network infrastructures appears to be subsiding. This month's Question Time asks a panel of industry experts whether this is indeed the case and how they see copper cabling technology developing over the next few years.

Copper's old adversary, optical fibre, is also examined. Dan Barrera of Trend Networks explains the options for the testing and certification of fibre optic cabling systems, while our old friend Piers Benjamin of Corning Optical Communications explains the issues when it comes to connecting devices at the edge.

We also have a special feature dedicated to cooling and climate management, comprising two excellent articles. In the first, Jason Matteson of Iceotope explains why it is essential that edge data centre designers focus on the precision liquid cooling of equipment. In the second, Steve Lorimer of Keysource explains why liquid cooling is much more effective at removing heat than air cooling – but might not be for everyone.

With lots more besides, I hope you enjoy this issue of Inside_Networks and if you'd like to comment on any of these subjects, or anything else, I'd be delighted to hear from you.

Rob Shepherd
Editor

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72 per cent of global businesses forge ahead with expansion plans despite economic concerns

Businesses around the world are planning major investments in digital technologies to support ambitious expansion plans following lessons learned from the coronavirus pandemic. New findings from Equinix suggest a movement toward a less connected world could not be further from the plans of digital leaders across industries and geographies. Despite concerns of a potential looming recession and talk at the World Economic Forum in Davos about the end of globalisation, businesses appear to remain bullish about their plans for further global expansion.


Eugene Bergen Henegouwen

Of the 2,900 IT decision makers surveyed in the Equinix 2022 Global Tech Trends Survey, 72 per cent indicated their organisation is planning to expand in the next 12 months into either a new city (31 per cent), a new country (33 per cent), or a new region entirely (38 per cent). The global sentiment was echoed by UK based IT decision makers, with 43 per cent planning expansion into a new region, 31 per cent into a new country and 26 per cent into a new city.

Overall, however, tech decision makers in EMEA were less ambitious in terms of expansion plans, with 59 per cent planning to expand into a new market in the next year – perhaps reflecting more caution around economic factors. By contrast, IT leaders in Asia Pacific (APAC) and in the Americas were more optimistic in this regard, with 82 per cent and 78 per cent intending to expand across geographies.

A number of potentially limiting factors were identified by businesses when it came to global growth, with supply chain challenges highlighted as a particular area of concern. 59 per cent said their business was plagued by global supply chain issues and shortages, while 58 per cent specified the global microchip shortage as a threat to their business.

These continued supply chain issues appear to be driving a need for more virtualisation, with growth aspirations underpinned by significant planned investment in digital infrastructure. Almost half (47 per cent) of respondents globally said they plan to facilitate expansion plans by deploying virtually.

The pandemic also continues to have a significant impact on businesses' digital strategies. More than half of global and UK IT leaders (52 per cent and 57 per cent respectively) say they are accelerating their company's digital evolution because of the pandemic. Over half confirm their IT budgets have increased as a direct outcome of its legacy – an insight into the now broadly acknowledged necessity for robust digital infrastructure to pivot to evolving business needs in an instant.

Eugene Bergen Henegouwen, president EMEA at Equinix, said, 'Technological changes made by companies across EMEA during the pandemic are largely here to stay, with a solid 58 per cent reporting this to be the case. Moreover, opportunities have been created for companies to accelerate their digital strategies – cloud adoption and interconnectivity between business partners continue to increase as a result.'

Macmillan Cancer Support presented with cheque following Inside_Networks 2022 Charity Golf Day

L-R: Caroline Woods of Marriott Hanbury Manor, Mark Cumberworth of Slice Golf and Events, Liam De Roe of Macmillan Cancer Support and Andrew Stevens of CNet Training

The Inside_Networks 2022 Charity Golf Day raised £10,480 for Macmillan Cancer Support. Liam De Roe, volunteer representative at Macmillan Cancer Support, was recently presented with a cheque that will help provide practical, financial and emotional support to people living with cancer.

Michelle Hutchinson, senior fundraising manager at Macmillan Cancer Support, said, 'I would like to extend our thanks to those who have helped to organise and support the Inside_Networks 2022 Charity Golf Day, as well as everyone who played and kindly donated on the day itself. We are overwhelmed with the total amount raised, adding to the thousands that have already been generously donated through this event down the years. We rely on our supporters to ensue Macmillan continues to be there for people living with cancer, whatever it takes.'

CNet Training achieves a silver medal in the EcoVadis 2022 Sustainability Rating

CNet Training has received a silver medal in the EcoVadis 2022 Sustainability Rating, which puts it in the top 25 per cent of 75,000 global organisations for sustainability. EcoVadis medals reflect the quality of the company's sustainability management system and are awarded based upon the percentile ranking of a company's EcoVadis score at the time of assessment.

CNet Training received excellent results in all four criteria including the environment, labour and human rights, ethics and sustainable procurement — cementing its position as a leader in corporate social responsibility (CSR). The company's operations director, Paul Rivett, said, 'Sustainability is essential for modern businesses and CNet Training is delighted that its commitment to it has achieved a silver medal in the EcoVadis 2022 Sustainability Rating. We are committed to sustainability as we grow our business, improve employee engagement and support the success of our customers, while helping to create a healthier, more socially responsible future.'

Increased IT complexity impacting ROI for 84 per cent of IT professionals

With hybrid and remote work amplifying the challenge of managing distributed IT environments, 84 per cent of IT professionals believe the return on investment (ROI) of their projects has been negatively impacted in the last 12 months, according to research from SolarWinds. It also shows a third (33 per cent) of IT professionals think complexity added between four and seven months of extra work to get their project to completion.


Sudhakar Ramakrishna

Commenting on the news, SolarWinds president and CEO, Sudhakar Ramakrishna, said, 'Many organisations are struggling to drive forward transformation amidst increasingly distributed and complex IT environments. In this challenging landscape, IT professionals are increasingly looking towards observability to manage these growing levels of complexity. By understanding where to prioritise their efforts, teams can manage hybrid IT realities more effectively and achieve the ROI targeted in their planned projects, which spells long-term success for teams, businesses and their customers.'

Schneider Electric creates education platform to address the data centre skills gap

Schneider Electric has announced a series of updates to its vendor agnostic and continuing professional development (CPD) accredited digital education platform, the Schneider Electric University. To date it has delivered more than one million courses to over 650,000 data centre users, with over 180 countries represented by its global user base.

The new updates to the Schneider Electric University Data Center Certified Associate (DCCA) qualification include fundamentals of power, cooling, racks and physical security, and guidance on how to optimise data centre designs to drive resilience, energy efficiency and sustainability. Its newest courses include Optimising Cooling Layouts for the Data Center; Fundamental Cabling Strategies in the Data Center; Examining Fire Protection Methods in the Data Center; and Fundamentals of Cooling II – Humidity in the Data Center.


Rob McKernan

Rob McKernan, senior vice president Secure Power Division at Schneider Electric, said, 'By providing guidance on the latest technology and sustainability initiatives, we believe the Schneider Electric University offers an invaluable resource to help bridge the skills gap by empowering business ecosystems, reskilling the workforce and training the next generation of professionals to build the data centres of the future.'

Opengear finds only 17 per cent of network managers are involved in digital transformation decision making

Opengear has found that while 90 per cent of chief information officers (CIOs) say they are involved in decision making for their organisations' digital transformation efforts, only 17 per cent of those CIOs report that network managers are similarly involved, and only 13 per cent indicate that network engineers play a role. The survey of CIOs and network engineers in the US, UK, France, Germany and Australia highlights the need for greater collaboration to deliver digital transformation and for CIOs to increase the involvement of network engineers.

The survey found that just 28 per cent of CIOs are very satisfied with their organisation's network engineering talent and only 15 per cent of network engineers are very satisfied with CIO leadership.


Gary Marks

However, there are positive signs that the two groups can work together more closely to address digital transformation.

'CIOs understand the importance of the digital capabilities and talents IT teams and network engineers bring to their organisations,' said Gary Marks, president of Opengear. 'Yet more is needed from CIOs and other executives to nurture and support these professionals. We must develop greater communication among leadership and engineers – not just in recruitment but also in training and change management. We must commit to involving network professionals much more in strategic decision making to drive the future of networking and digital transformation.'

NEWS IN BRIEF

Analysis by Atlas VPN has revealed that General Data Protection Regulation (GDPR) fines hit a total of €97.29m in the first half of 2022. Even though the number of GDPR violations slightly decreased in 2022, the severity of those violations was considerably worse.

98 per cent of UK organisations experienced some form of a security incident in the last 12 months, according to a report from Barracuda. The data revealed that web application attacks were the most common security incident for UK organisations, with 45 per cent encountering at least one in the last 12 months.

Wireless Logic has acquired Mobius Networks for an undisclosed sum.

NS1 has joined the Intel Network Builders program within its Network Edge Ecosystem. As a member, NS1 will work with Intel and its ecosystem partners to build new ways to deliver content to users with greater speed, reliability and security.

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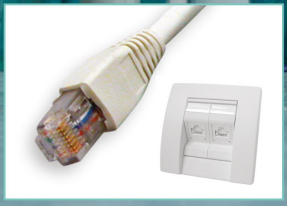

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Why we must all act on

Hi Rob

The Health & Safety Executive (HSE) has brought in new guidelines to cover the proper maintenance of industrial uninterruptible power supply (UPS) systems. This move followed investigations into a number of dangerous occurrences that resulted from a failure of industrial UPS systems.

The guidelines state that UPS designers, manufacturers, importers and suppliers should 'review the information for maintenance (including inspection) provided historically to all end users of your industrial UPS systems and determine if you need to provide more up to date information, resulting from experience in use, design modifications, limitations on use or anything else that gives risk to a serious risk to health and safety. Following this review, designers, manufacturers, importers and suppliers should take steps to ensure, so far as is reasonably practicable, that all affected end users are provided with all revisions of information to assure safe and reliable continued operation.'

I welcome this safety notice. As an industry we must all do more to ensure the correct and safe maintenance of all UPS systems. We are talking about both AC and DC power here! However, from a manufacturer and service provider's perspective, there are other challenges that I believe also need to be openly discussed.

Like the majority of other manufacturers, we already clearly state the design life of components in our documentation. We also recommend a fully comprehensive preventative maintenance plan to ensure components with a finite life are replaced at the appropriate time. But here's where things can occasionally go wrong. Our field service reports may clearly state the need for remedials, but I know I won't be the only one who's seen long delays in the approval of these works, putting the critical load at risk. This response is a dangerous one!

safer UPS maintenance

There is a further issue. When value engineering becomes the focus, quality and performance can be compromised. This can influence the decision to purchase a product that does not fully adhere to the original specification. This can have a knock-on effect on the organisation's maintenance plan and may result in a variety of manufacturers supporting one site. This could mean multiple maintenance plans or one plan fulfilled by a third-party provider that may not have factory trained engineers, access to the right firmware updates or spare parts.

At Centiel, we ensure that our clients receive a minimum of two preventative maintenance visits per year. Field service reports highlight remedial actions to be taken and in what timeframe. 24/7/365 technical support and callout response is backed-up by service level agreements and we provide spare parts and firmware. However, perhaps this is not going far enough? Perhaps as an industry we should consider introducing something even more definite. Maybe an annual 'MOT', where insurance certificates are only issued if the UPS passes?

The HSE is right to issue this important safety notice. However, everyone needs to consider a safe approach and heed manufacturer recommendations. They are recommendations for a reason.

Louis McGarry
Centiel

Editor's comment

I'm sure Louis is not alone in welcoming this new HSE guidance. Whether it goes far enough is questionable though and there are bound to be discrepancies amongst UPS manufacturers in terms of the information they provide. Therefore, perhaps the idea of industry wide standardisation is worth considering.

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Stick or twist?

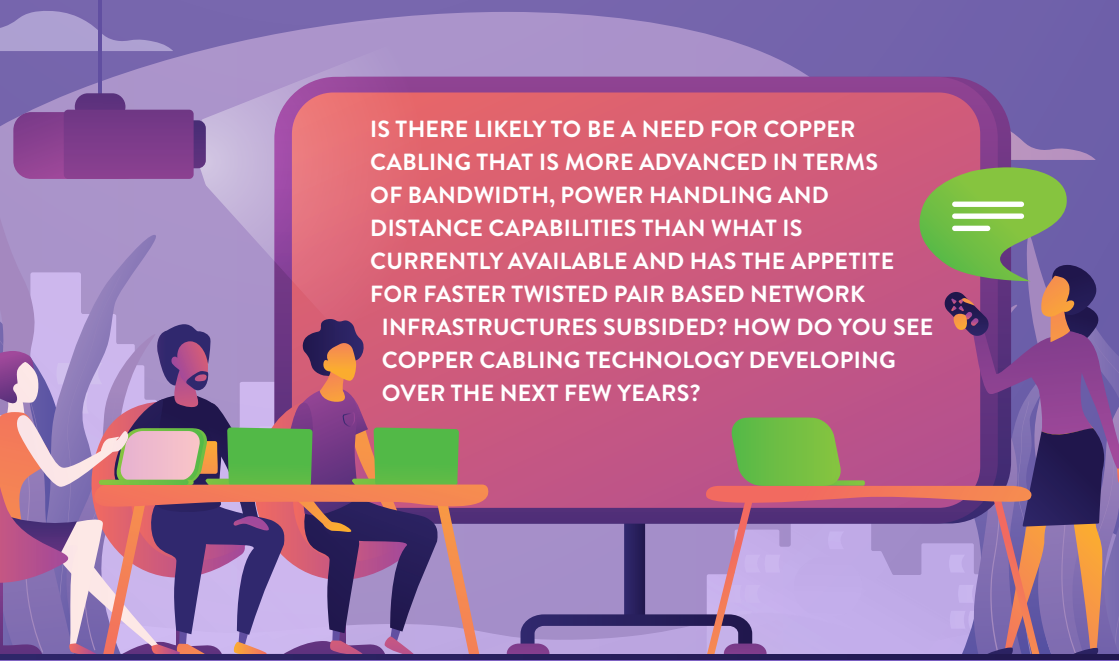
It seems that the desire to develop copper cabling that can exceed current bandwidth, power handling and distance capabilities is on the wane. Inside_Networks has assembled a panel of industry experts to discuss whether this is in fact the case and what the future holds for this technology.

For over 20 years the regular predictions about the death of copper as an effective cabling medium for higher speed network applications have proved premature. In fact, when Category 8 cabling and components were introduced they were able to offer four times the bandwidth of Category 6A, even though, with a distance limitation of 30m, the benefits of it could only be fully exploited when used in a data centre.

Copper solutions continue to solve connectivity needs from residential applications to complex data centre installations. While there is no one size fits all solution for cabling infrastructure, category rated copper still remains a viable solution thanks to backwards compatibility, auto-negotiation, established RJ-45 jack terminations and cost effectiveness. Likewise, when it comes to intelligent buildings and industrial automation, Category 6A appears to fulfil most requirements.

So is there a need for bigger, better and faster copper cabling? Inside_Networks has assembled a panel of experts to discuss this and look at how this technology and its applications will develop over the next few years.

Don't forget, if you have a question that you would like answered **CLICK HERE** and we'll do our best to feature it.



STUART MCKAY

SENIOR PRODUCT MANAGER EMEA AT PANDUIT

For over 30 years twisted pair cabling has been used to transmit voice, data and power over the same infrastructure. In that time, we have witnessed technology improvements that have expanded the use of it across, domestic, enterprise and industrial infrastructure. It has been an essential element in integrating factory operational technology and information technology on a common single twisted pair Ethernet platform.

Power and data to remote devices over the latest Single Pair Ethernet (SPE) cabling up to 1000m, using a compact 18AWG cable and connector format, has increased flexibility and ease of use across organisations. Industry 4.0 is also being delivered through this single technology from edge sensors to the corporate desktop via SPE copper cable. It provides the capability of data transmission speeds up to 10Mb/s, with power up to 52W over distances of 100m.

The importance of power over twisted pair should not be overlooked, especially for remote powered devices. The IEEE 802.3bu standard provides remote DC power over an SPE connection, called power over data line (PoDL). This is like power over Ethernet (PoE) technology for standard Ethernet, which is transforming smart building electrical and data communications infrastructure.

Twisted pair is gaining traction as a viable alternative for connecting systems within smart buildings and industrial automation.

As for the future of twisted pair, several recent research papers indicate that in places where replacing all the copper cabling is a costly and time-consuming operation, alternative ways to improve data speeds are required.

One study explored the upper limits of twisted pair operations at frequencies above 1GHz and demonstrated that standard twisted pair used in the UK can be used up to 5GHz carrier frequency. Higher carrier frequencies on twisted pair can enable the data rates required by future communication networks, allowing existing copper infrastructure to be utilised on the last mile, complementing optical fibre networks.

Fibre optic cables will always provide higher data rates at a premium, but while building this infrastructure we can improve twisted pair networks to increase throughput while in transition.

‘POWER AND DATA TO REMOTE DEVICES OVER THE LATEST SINGLE PAIR ETHERNET (SPE) CABLING UP TO 1000M, USING A COMPACT 18AWG CABLE AND CONNECTOR FORMAT, HAS INCREASED FLEXIBILITY AND EASE OF USE ACROSS ORGANISATIONS.’

Dunasfern General Manager, Glenn ward with Brother UK Business Manager, Natalie Knott and Head of SPS Business Unit, Ged Cairns

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BARRY ELLIOTT
DIRECTOR AT CAPITOLINE

Do we need more bandwidth for a copper cable system? No – we have Category 6, Category 6A, Category 7 and Category 8 already. Category 6 gives us 250MHz bandwidth over 100m and Category 6A gives us 500MHz over 100m, which maps out to 5Gb/s and 10Gb/s data capacity respectively (IEEE 802.3an and IEEE 802.3bz). For individual users this is plenty. I have a 500Mb/s internet link to my house and it has become clear that there aren't many devices, internally or remotely, that I can communicate with faster than about 50Mb/s.

For shorter distance links, as we might see in data centres, we also have Category 8. This gives us 2GHz bandwidth over 30m, which equates to 40Gb/s (IEEE 802.3bq). Restraining gigahertz frequencies within copper cables inevitably leads to more screening/shielding and therefore a bigger, heavier and more expensive cable.

In my data centre auditing work the vast majority of installed copper cable plant that I see is still Category 6 and we have only recently started to see Category 6A installations. More and more data centres have no copper interconnections at all – it's all optical fibre.

Data centres pick fibre for all the usual reasons of speed, distance, security, freedom from interference but also physical volume restrictions. Many data centres could not achieve their communications requirements with copper cabling because they simply don't have the physical space required. I estimate there is about a 50:1 volume ratio between copper cabling and multimode optical fibre when comparing 10Gb/s data channel capacity.

Price is also a limiting factor. Copper cables are basically made of copper and oil. In the last three years copper has risen by 65 per cent and oil by 122 per cent, whereas the cost of silica is the same as it was in 2018.

If you look at the activities in the copper data cabling marketplace and standards committees, then all the talk is about Single Pair Ethernet, longer transmission distances, more power carrying capabilities, automotive Ethernet and smaller connectors. If you need more bandwidth, use optical fibre!

'IF YOU LOOK AT THE ACTIVITIES IN THE COPPER DATA CABLING MARKETPLACE AND STANDARDS COMMITTEES, THEN ALL THE TALK IS ABOUT SINGLE PAIR ETHERNET, LONGER TRANSMISSION DISTANCES, MORE POWER CARRYING CAPABILITIES, AUTOMOTIVE ETHERNET AND SMALLER CONNECTORS.'

CHRISTOPHE HINET

GLOBAL PRE & POST TECHNICAL SALES MANAGER AT MOLEX CES

Category 6 was introduced in June 2002 and Category 6A was introduced just six years later in 2008. Category 6A has been with us now for more than 14 years, while Category 8, which delivers four times the bandwidth of Category 6A, has now been with us for six years but is only installed for specific applications. So, copper cable is still delivering improvements, but at a slower pace. Is that a concern?

Many applications are arising that are actually demanding less bandwidth – think the internet of things (IoT), sensors, actuators and Single Pair Ethernet. Interest in these technologies is rapidly increasing but accompanied by reduced demands on bandwidth. So the pace of technology innovation is not slowing down – instead, copper cable is blending with new innovations in electronics that leverage a more sophisticated and interrelated ecosystem.

Copper has intrinsic physical and electrical limits. However, there are many areas where the performance of copper cable installations can be improved without the need for more advanced media – better upfront planning, higher quality cable, correct choice of cable and components, zone cabling architectures and, of course, adhering to installation best practices.

Even for the most sophisticated technologies, the need for more advanced copper media in terms of bandwidth, power handling and distance capabilities is currently being complemented with more advanced electronics, protocols and signal processing techniques.

For example, the encoding used by HDBase-T enables it to better handle electrical interference and a higher bit error rate, without affecting performance. The codec utilised by software defined video over Ethernet (SDVoE) benefits from minimal latency and exceptional quality with very little compression. This enables it to deliver audiovisual output up to 9Gb/s – still leaving 1Gb/s for data traffic and all on Category 6A. When these other elements are considered in the equation, category cables remain the primary option for modern smart buildings.

The bottom line is that I do not expect any revolutions in copper cabling technology in the next few years.

'THE PACE OF TECHNOLOGY INNOVATION IS NOT SLOWING DOWN – INSTEAD, COPPER CABLE IS BLENDING WITH NEW INNOVATIONS IN ELECTRONICS THAT LEVERAGE A MORE SOPHISTICATED AND INTERRELATED ECOSYSTEM.'

NICK EDWARDS

PRODUCT MANAGER FOR INTERNAL CONNECTIVITY AT HELLERMANNTYTON

The short answer is no – I do not think there will be an appetite for more advanced twisted pair cabling that offers greater bandwidth, power and distance.

Firstly, the cable alone would be much larger and more difficult to work with than its predecessors. A larger cable means bigger containment, more difficulty handling it during installation and a larger bend radius to contend with. It would also be more sensitive to crosstalk and other interference. I just think the negative aspects far outweigh any benefits.

The buck really stops with Category 6A as a long-term viable network cabling solution. Offering 10Gb/s at a bandwidth of 500MHz, this is more than enough for most private or public sector environments, whether enterprise, financial, medical or educational. Many do not even come close to ever fully utilising this throughput.

I see the market evolving the applications in which twisted pair cabling can be used rather than developing the next system. We can already see this in action if we think about power over Ethernet (PoE), which is currently at Type 4 offering 100W of power, and Single Pair Ethernet cabling growing in popularity in the automotive and industrial markets. NGBASE-T 2.5Gb/s and5Gb/s is possible over legacy cabling, while the rise of the field installable plug for modular plug terminated link (MPTL) applications through to Category 6A is growing in popularity in the audiovisual market.

Category 6A demand continues to grow and diversify in terms of its wider applications and use in other industries. This is where I see the future of copper cabling.

From an enterprise or campus perspective we should look to mirror the FTTX market and push optical fibre to copper conversion point as close to the device as possible by implementing passive optical LAN (POL). POL is still quite niche, but curiosity is starting to grow amongst end users and network designers, especially those that prioritise the need for greater bandwidth and distance. With availability of hybrid powered fibre cables there is even an answer for remote powering requirements.

‘THE BUCK REALLY STOPS WITH CATEGORY 6A AS A LONG-TERM VIABLE NETWORK CABLING SOLUTION. OFFERING 10GB/S AT A BANDWIDTH OF 500MHZ, THIS IS MORE THAN ENOUGH FOR MOST PRIVATE OR PUBLIC SECTOR ENVIRONMENTS, WHETHER ENTERPRISE, FINANCIAL, MEDICAL OR EDUCATIONAL.’

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PAUL MALONE

HEAD OF CONNECTIVITY DESIGN & ESTIMATING AT SUDLOWS

With fibre optic cabling, particularly singlemode hyperscale designs now dominating the data centre environment, it once again brings into question the longevity of copper cabling and the need to push this media for higher speeds. The consensus is that copper cable has finally reached its capacity in terms of speed and bandwidth.

The popularity of singlemode cable and transceivers has reduced manufacturing costs for these products and, in turn, made the singlemode SFP transceiver price competitive with the QSFP OM4 counterpart. This has influenced the requirement for OM5 solutions, which are now seen as cost neutral versus a superior singlemode connection. The combination of low cost singlemode transceivers and the raw materials available to produce these links seems to have finally eroded the need to get more from our trusted old copper comrade.

Over the past 10 years we have seen the requirement for Category 5e and Category 6 on a steady decline, whereas Category 6A has become the number one choice for enterprise environments, surpassing Category 6 revenue globally. During this same period Category 7, 7A and 8 systems have remained stagnant. It seems the 40GBASE-T applications are not popular enough to warrant progression to 100BASE-T and beyond.

What we can take from these numbers is that that Category 6A looks to be coming into its own after its original release in 2009. Key reasons being best in class for power over Ethernet (PoE) support, RJ-45 classic connector design, 10GBASE-T over 100m channel and simple cost effective provisioning.

The fact that that Category 6A cable is being utilised more than ever and its ability to comfortably deliver current and some future applications, along with its PoE capacity, mean it will not be going anywhere in the short-term. Additional developments in PoE lighting and Single Pair Ethernet application will continue to utilise copper cable's versatility for years to come.

> 'THE FACT THAT THAT CATEGORY 6A CABLE IS BEING UTILISED MORE THAN EVER AND ITS ABILITY TO COMFORTABLY DELIVER CURRENT AND SOME FUTURE APPLICATIONS, ALONG WITH ITS POE CAPACITY, MEAN IT WILL NOT BE GOING ANYWHERE IN THE SHORT-TERM.'

MATTHIAS GERBER
MARKET MANAGER LAN CABLING AT R&M

We're seeing rapid developments and growing performance demands in all of the mentioned areas – bandwidth, power and length. However, I think it's vital to realise that you won't find a solution to all of these challenges using only one single development. A variety of solutions is currently being created, each focusing on specific challenges, and these solutions aren't necessarily related or interoperable.

• Bandwidth

Current key challenges for the LAN include high frequency transmission for 10Gb/s to 40Gb/s, reliable remote power supply for power over Ethernet (PoE) and comprehensive Ethernet/IP coverage. Cat.8 provides an excellent solution for broadband and 25/40 Gigabit Ethernet applications. It can support data speeds up to 10Gb/s at a full 100m channel configuration, or 25Gb/s and 40Gb/s for channel lengths of up to 50m or 32m respectively. It also supports PoE along with data, whereas with optical fibre you require a separate power delivery network.

• Power

For PoE delivering ever-increasing levels of electricity, management of the cabling installation is becoming more and more important. You may need to introduce cables with lower resistance or higher gauges, or the capacity to handle higher temperatures. The effects of temperature increases in the cable caused by power transmission, degrading wire termination contacts or damaged RJ-45 contacts as a result of sparks when unplugging under load need to be carefully considered.

• Length

Single Pair Ethernet (SPE) facilitates longer reach and can extend operational length up to as much as 1km. In smart buildings and industrial automation applications, it can connect devices up to sensor/actuator level utilising standard IP. SPE can supplement existing cabling structures like digital ceiling for the last few meters, but shouldn't be seen as a complete replacement of RJ-45 technology.

Making the most suitable choice of cabling requires a careful analysis of your current and future requirements in the areas of bandwidth, power and distance. Sometimes compromise will be inevitable, or you might need to choose different solutions for different parts of the network. When in doubt, definitely speak to an expert!

'FOR POE DELIVERING EVER-INCREASING LEVELS OF ELECTRICITY, MANAGEMENT OF THE CABLING INSTALLATION IS BECOMING MORE AND MORE IMPORTANT. YOU MAY NEED TO INTRODUCE CABLES WITH LOWER RESISTANCE OR HIGHER GAUGES, OR THE CAPACITY TO HANDLE HIGHER TEMPERATURES.'

Multiple testing options in

AEM is a global leader in test and measurement solutions including the Network can carry out a wide range of tests and fault finding checks. The NSA is available

Imagine you are an IT manager of a company with multiple offices, or an installer supporting an end user customer. The cost of a certification cable tester, often over £12,000, might not be justified for checking out why a user cannot use their PC. Most cable certification testers are limited in fault finding and are primarily designed for cable certification testing. They are generally used so the installer of the network cabling system can obtain a system warranty from the cabling manufacturer.

Logical progression

So, if an office worker reports they cannot access the internet with their PC, the first logical thing would be to confirm that the installed cable has not been damaged and still meets the standard it adhered to when first installed. If it does, the next step could be to ping the servers to find out if there's a network connection and possibly run a traceroute test, which would indicate a problem with the service provider and ascertain if the latency is far too slow. Hopefully, the problem is solved!

But what if the organisation has a widely deployed Wi-Fi network – how would you test this? The first step would be to test the cable to the client's access point (AP). If that's performing correctly, you can perform all the other networking tests described above via the AP.

Put to the test

With the AEM NSA tester, these tests can be carried out easily and at a fraction of the cost of a certification tester. For instance, the NSA has a convenient screen that shows the signal strength of APs in a bar chart.

Most intelligent buildings are now deploying power over Ethernet (PoE) devices. What happens when they are not working correctly? A common problem with PoE devices is that the switch they are connected to often does not have enough power budget to power up the device. Doing a PoE test under load will instantly tell the IT manager how much power in watts and voltage is being delivered to the device. These are both critical and valuable, as you can confirm that the device has

one device

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Service Assistant (NSA), which exclusively through Mayflex in the UK

enough power. With the NSA, this is a quick and simple test to carry out.

Office talk

Often large offices have fibre optic cables installed in them. The NSA can also test these. Singlemode and multimode loopback testing ensures cable quality and includes a report of all supported network speeds based on cable performance. An integrated visual fault identifier identifies any cable breaks.

Another test that an IT manager may find helpful is Multi-Gigabit Ethernet link speed testing. NSA can validate a link to ensure Ethernet can be supported at 1GBASE-T, 2GBASE-T, 5GBASE-T and 10GBASE-T. It can perform signal to noise ratio (SNR) measurements while under traffic and PoE load, providing confidence that a cabling link will support the desired network rate.

NSA – unmatched in the industry

The award winning NSA was designed with IT managers in mind due to the assortment of technologies they are responsible for managing, particularly in intelligent buildings. The NSA can carry out all the tests in the examples given above.

AEM took a unique approach to provide a breadth of test functions unmatched in the industry and thoughtfully designed the NSA to keep the price point representative of significant cost savings from having to purchase multiple pieces of test equipment. The NSA is modular and allows users to pick and choose the exact testing function they need.

Discovery channel

With the multitude of other testing required for smart/intelligent buildings, only one tester can help you fault find, and that is the AEM NSA. Can your current testers perform all these tests? Talk to Mayflex to find out more about the AEM NSA and just how competitively priced it is!

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Sweetness and light

Piers Benjamin of Corning Optical Communications explains the key issues when it comes to connecting devices at the edge

A march towards higher power, as well as the explosion of technologies spurred by the internet of things (IoT), has pushed the number of devices powered in our spaces through the roof. Recent forecasts expect the amount of devices for each individual to double by 2030. As a result, we've seen optical fibre make its way further into the horizontal local area network (LAN), but often in more specialist deployments such as government environments.

GET REAL

Now, with the rise of real time applications that need processing at the edge such as security, telecommunications, life safety and building automation systems, businesses of all kinds are seeing a need to start migrating data workloads deeper into the network. IP cameras and security devices, in particular, are now common throughout indoor and outdoor spaces, but may not be close to existing telecom rooms or a power over Ethernet (PoE) based switch.

This can challenge an exclusively twisted pair copper infrastructure from distance, bandwidth, pathway space and flexibility points of view, and it's no secret that when it comes to high speed transmissions and capacities, copper cables are reaching their limit. Traditional structured wiring also requires a proliferation of cabling in the horizontal pathway, creating network congestion that is hard to manage over time.

SUPPLY AND DEMAND

With the added hindrances of aging installations and packed telecoms rooms, it is critically important to develop a LAN that meets current and future demands – with minimal impact to facilities. Fibre is the obvious solution for connecting end devices in the LAN and this can be achieved directly or via equipment like media converters or optical network terminals (ONTs), in point to point or point to multipoint passive optical networks.

Fibre to the edge (FTTE) is ideal for businesses that need high capacity and flexibility in their networks. Optical fibre delivers the high bandwidth, low latency, reach and flexibility required to meet the demands of developing applications like next generation Wi-Fi, high availability audiovisual (AV) and 5G within a single building or across a large campus. Capitalising on the reach of fibre cable enables multiple devices to connect via a single cable that can reach back to a

common central point that can serve multiple floors.

KEY ELEMENTS

Like every enterprise IT network, an FTTE based LAN comprises active and passive components. The most important elements are:

- Long-reach, flexible power and data
- Intelligent remote power solutions
- Ending rip and replace network planning

In a traditional enterprise LAN IT architecture, data is transmitted either entirely by copper or through a combination of a fibre backbone plus copper to the edge, requiring equipment closets, or intermediate distribution frames (IDFs), throughout the network. An FTTE architecture is fully optical, with fibre carrying all data transmission. This allows the network to operate from a central equipment room, or main distribution frame (MDF), eliminating the need for IDFs and reducing power and cooling expenses in the process. The extremely high bandwidth enabled by an FTTE architecture makes it possible to wirelessly operate many edge devices, reducing the need for individual wiring and porting.

SOMETHING IN THE AIR

Power for an FTTE based LAN is best supplied using composite cabling, which contains both fibre and copper. This leverages the bandwidth capabilities of singlemode fibre and the powering capabilities of copper to deliver both data and power to enable devices at the edge of the network. Composite cable can take up much less space and this means more

'While there is still a place for copper in connected building infrastructure, limitations in bandwidth, power handling and distance mean networks should be designed to push the fibre to copper transition point deeper into the network, or to the edge of it.'

capacity for future upgrades and, often, reduced maintenance costs.

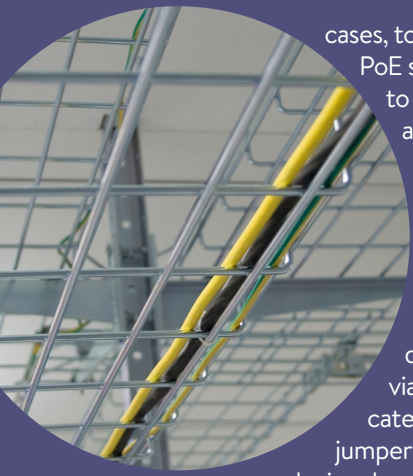
This also has important applications when it comes to next generation Wi-Fi. Most of us will currently be using the sixth generation of Wi-Fi, which is a well-established standard. The next iteration, Wi-Fi 6E, is starting to become more prevalent and offers an extension of this standard to the 6GHz band, greatly reducing network congestion. Wi-Fi 7, the next generation, should be with us within the next few years.

What this all means is a need for building owners to pull additional cable, with Wi-Fi 6E needing up to 10Gb/s of data and Wi-Fi 7 requiring up to 40Gb/s. This can be achieved with four Category 6A cables, with a distance limitation of 90m, or with one composite cable that will also offer greater distances on the power and data.

GOING DEEP

Another integral part of a fibre design is the remote powering solution. A power supply unit is a straightforward solution that can be stacked up based on the number of devices required. The ports can also be split depending on the PoE requirements, the total budget and distance away from the endpoint. There are many long range solutions that can support devices on the perimeter of a property – even across distances of over 600m in some cases.

High and low voltage is sometimes delivered directly to end devices such as an interactive AV display and, in other



cases, to smaller PoE switches to connect and power nearby access points, smart lighting and IoT devices via short category jumpers. If a device doesn't feature a fibre input/output – a security camera, for example – conversion equipment can change the signal from optical to electrical and connect to the device with a short copper patch cord. This is another integral part of a FTTE network design and there's a number of cost effective options that can support 10Gb/s speeds and offer backward compatibility to support 1Gb/s or 2.5Gb/s speeds.

FUTURE READY NETWORK

While there is still a place for copper in connected building infrastructure, limitations in bandwidth, power handling and distance mean networks should be designed to push the fibre to copper transition point deeper into the network, or to the edge of it. FTTE gives a future flexible infrastructure ready to deliver connectivity, virtually unlimited bandwidth and thousands of watts of safe power throughout a building. By reducing the space needed for network equipment and converging multiple networks into a single, streamlined one, impact on resources is reduced and can all help make a real difference. ■

PIERS BENJAMIN

Piers Benjamin joined Corning Optical Communications in 2018 as EMEA marketing manager for in-building networks. He has over 10 years' experience within the industry, with past marketing roles including working for a UK distributor. At Corning, Benjamin is responsible for the marketing activities of the traditional LAN and the fibre to the edge technologies.

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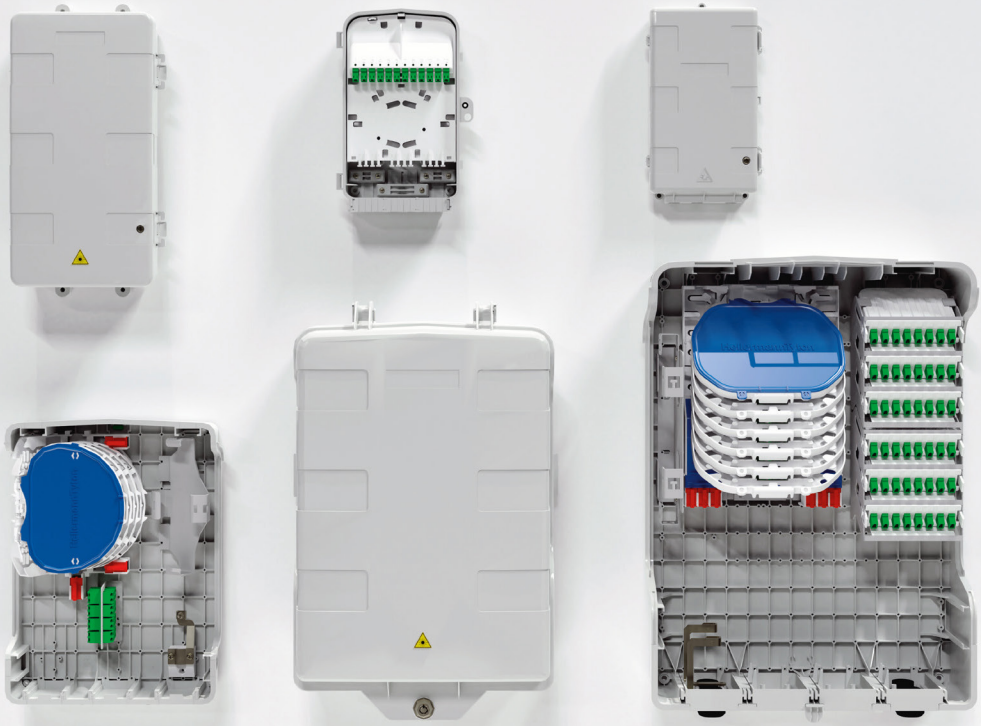

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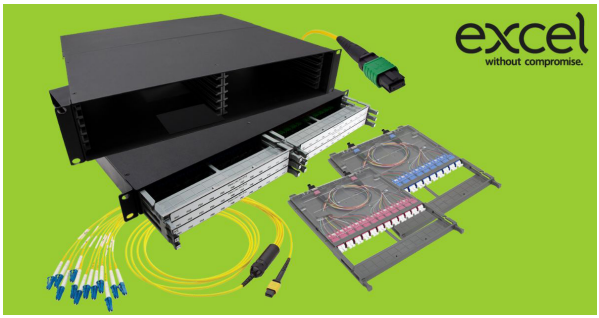

Our range of Excelerator MTP Elite fibre optic trunk and fan out cables offers a pre-terminated optical fibre solution that is factory tested in a range of core counts. With bend insensitive fibre as standard and a fast turnaround this is a range you can trust and rely on. Learn more about our specialist support services.

All Excel fibre products are covered by a comprehensive 25-year warranty when installed by an Excel Partner. Browse our fibre catalogue to learn more about our extensive range.

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Flexible end to end Huber+Suhner data centre optical fibre connectivity solutions are available from stock at EDP Europe.

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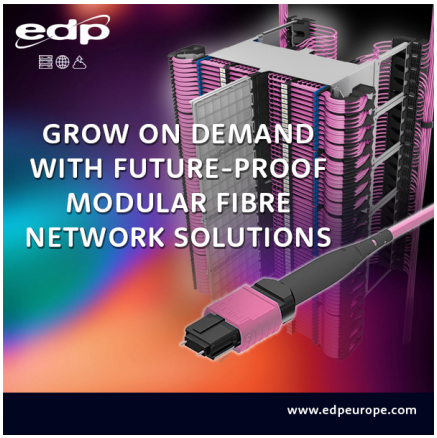

Data centres can scale their growth efficiently and cost effectively by deploying leading edge, scalable, modular connectivity systems that provide future proof solutions from day one. The flexibility offered by Huber+Suhner's CDRs, IANOS and MTP Pro solutions provides a comprehensive foundation from which a data centre can grow on demand and in parallel to its customers' current and future requirements.

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www.edpeurope.com

Trend Networks

The FiberMASTER optical time domain reflectometer (OTDR) from Trend Networks is a simple, handheld tester for troubleshooting, installing and certifying optical fibre cable. Available in quad, multimode and singlemode models, it is designed for Tier 2 fibre cable certification.

As one of the smallest OTDRs in the world, FiberMASTER is easy to carry and operate, with ruggedised housing to protect your investment. The tester is simple to set-up and easy to use, thereby saving training time and reducing the likelihood of errors.

FiberMASTER features industry leading dynamic range and small dead zones, enabling users to test longer fibres and passive optical network (PON) systems, and maintain accuracy on high loss fibres. The onboard software also provides a pass/fail report to TIA/ISO/IEC/IEEE requirements. Custom test parameters can also be set for any application.

The compact FiberMASTER OTDR is an essential for accurate test data, yet offers a cost saving of around 50 per cent compared to other premium brands.

To find out more **CLICK HERE.**
www.trend-networks.com

Networks Centre

As an increasingly essential part of network infrastructure, fibre optic cabling systems provide high speed data communications for both telecom providers and enterprises. That's why an effective fibre distribution management system is critical for managing multiple or large volumes of fibre optic cable, while providing flexibility and reliability in all environments – from the central office to outdoor closures and building premises, particularly data centres.

Networks Centre continues to provide not only fibre cable from its expanding network of warehouses, but also offers high quality solutions to manage and control the cabling infrastructure. Panduit's FlexCore optical distribution frame (ODF) can reduce floor space by up to 50 per cent. This ensures optimal network performance, while reducing capital and operational expenses.

There isn't a one size fits all fibre optic cabling system. Compatibility may depend on many factors including density, distance, performance and manageability – not forgetting to consider if there is an upgrade path for future needs.

Networks Centre can help telecom providers and enterprises achieve network optimisation goals. **CLICK HERE** for a reliable solution or call 01403 754233.
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Cable Management Warehouse (CMW)

The importance of using a professional labelling and identification solution when installing an optical fibre cabling system should never be underestimated. Using easy to create labels that won't cost you a fortune to implement will help engineers identify cables quickly and efficiently, whilst helping to avoid any unnecessary downtime.

Available from CMW, the new Brady PIA/PIANO tags are designed specifically for use with fibre cabling. The labels are made from white opaque polyethylene material with a yellow topcoat specifically formulated for thermal transfer printing. They are easy to attach without the risk of damaging your fibre cables.

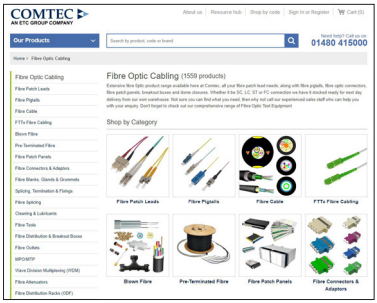
The facestock resists tearing and the topcoat resists smudging and abrasion when printed with Brady thermal transfer ribbons. Using a Brady BMP61 printer, an R-4310 ribbon and the Brady Workstation software, you can easily create the labels you need. You can even print them from your phone when you use the Brady Express Labels app.

CLICK HERE to find out more about this new fibre cable identification tag or call 01252 917300.

www.cmwltd.co.uk

Comtec

Comtec, part of ETC Group, stocks a wide range of fibre optic materials for every installation type and specification. Key brands include CommScope (NETCONNECT and SYSTIMAX), Corning, HellermannTyton, Huber+Suhner, Molex, Nexans, Prysmian Group (Draka and Prysmian), Siemon and Ultima.



We have indoor fibre cable in an array of Construction Products Regulation (CPR) specifications including Eca, Dca, Cca and B2ca, with core counts from 4-fibre up to 96-fibre. There is also extensive stock of aerial and outdoor fibre optic cables specifically design for FTTX applications including overhead, pole and duct installations.

Also in stock is a full range of fibre optic panels, pigtails, patch leads and accessories for enterprise, data centre and FTTX networks. Our optical raceway systems are ideal for routing and protecting fibre cable between termination equipment, cabinets or frames and data centres, offering flexibility whilst driving down installation time. Fibre tooling, installation consumables and test and measurement equipment complete the portfolio.

CLICK HERE to find out more about the fibre range available from Comtec or call 01480 415000.

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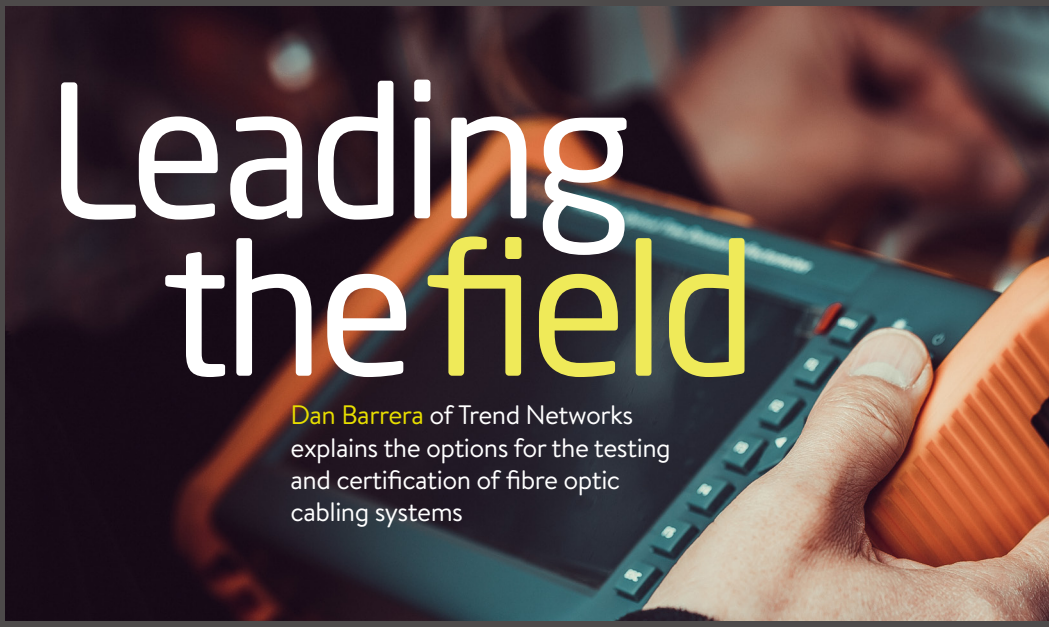


Leading the field

Dan Barrera of Trend Networks explains the options for the testing and certification of fibre optic cabling systems

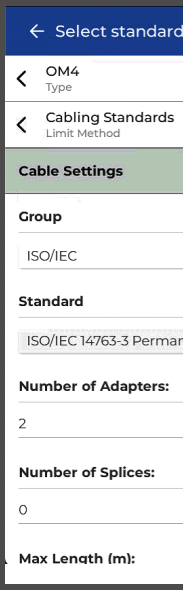
Field certification of fibre optic cable is critical to ensure that cabling performance supports the demanding requirements of today's high bandwidth applications. Allowable signal loss can be so low that seemingly small issues can cause excessive errors in network transmission. Field certification has two tiers that define the measurements performed on installed fibre – Tier 1 and Tier 2 – which utilise different types of test equipment to characterise performance. Additionally, the test limits used to determine pass/fail performance can be cabling based to support a broad range of applications to check the fibre's ability to support specific speeds of network equipment.

TIER 1 CERTIFICATION

Tier 1 certification documents the insertion loss and length of the cabling. Insertion loss is also known as attenuation, which is the total amount of power lost across the link. It is measured using a light source and power meter – an optical loss test set (OLTS) – where a known amount of light is injected into one end of the fibre and the power is measured at the other end. The difference between the two power levels is the insertion loss, which is displayed in decibels (dB). An OLTS can be a standalone device or, more commonly, a set of modules that is added to a copper cable certifier.

FIBRE LOSS LIMITS

The ISO and TIA standards bodies have defined dB allowances for fibre loss, connections and splices. These three components comprise the cabling system and the values are used to calculate a loss budget, which is the maximum amount of loss allowed for the link to pass certification. Calculating the loss budget is a matter of multiplying the length of the cable by its attenuation coefficient, which determines the maximum loss for the fibre, then summing up the number of



adaptors/connections and splices to arrive at the total allowable link loss.

The complication with calculating a loss budget is that it changes depending on the length of the fibre under test. Short fibres have less loss than long fibres. To calculate the budget, a technician needs to know the length of the fibre that is being tested. Therefore, a certifier that measures length is preferred over one that does not. Such a certifier first tests the fibre to measure its length, then it calculates the loss budget using the length measurement. The technician only needs to input the number of connections and splices into the budget calculator to arrive at the total allowable loss.

Cabling loss budgets are application agnostic, meaning they are not designed to support any particular network speed, such as 40Gb/s. Instead, they are based on the maximum allowable losses for the components, as defined by ISO and TIA standards, and it is assumed that an application will run on the installed cabling if its loss is within budget.

NEED FOR SPEED

When the speed of the networking equipment that is going to be run over the fibre is known, a test limit based on application standards can be used. For Ethernet these would be limits for 10 Gigabit Ethernet, 25 Gigabit Ethernet, 40 Gigabit Ethernet, 100 Gigabit Ethernet etc.

Application limits define the maximum insertion loss and length values for that type of optical transceiver. Testing fibre cabling with application limits is not typical for cabling installers, as they do not usually know what networking equipment the end user is going to run on the fibre. However, in cases where the network designer knows what application is intended to run on the fibre, they can instruct the cabling installers about the test limits to use. Or network owners who perform their own cabling moves, adds and changes, and have access to test equipment, can measure the loss to ensure it is appropriate for their network.

Multimode Ethernet Applications	Fiber Type	62.5/125 µm		50/125 µm		850 nm laser-optimized 50/125 µm			
	Fiber Standard	TIA 492AAAA (OM1)		TIA 492AAAB (OM2)		TIA 492AAAC (OM3)		TIA 492AAAD (OM4)	
	Nominal wavelength (nm)	850	1300	850	1300	850	1300	850	1300
Application	Parameter								
Ethernet 10/100BASE-SX	Channel attenuation (dB)	4.0	-	4.0	-	4.0	-	4.0	-
	Supportable distance m (ft)	300 (984)	-	300 (984)	-	300 (984)	-	300 (984)	-
Ethernet 100BASE-FX	Channel attenuation (dB)	-	11.0	-	6.0	-	6.0	-	6.0
	Supportable distance m (ft)	-	2000 (6560)	-	2000 (6560)	-	2000 (6560)	-	2000 (6560)
Ethernet 1000BASE-SX	Channel attenuation (dB)	2.6	-	3.6	-	-	-	-	-
	Supportable distance m (ft)	275 (900)	-	550 (1804)	-	Note 1	-	Note 1	-
Ethernet 1000BASE-LX	Channel attenuation (dB)	-	2.3	-	2.3	-	2.3	-	2.3
	Supportable distance m (ft)	-	550 (1804)	-	550 (1804)	-	550 (1804)	-	550 (1804)
Ethernet 10GBASE-S	Channel attenuation (dB)	2.4	-	2.3	-	2.6	-	2.9	-
	Supportable distance m (ft)	33 (108)	-	82 (269)	-	300 (984)	-	400 (1312)	-
Ethernet 10GBASE-LX4	Channel attenuation (dB)	-	2.5	-	2.0	-	2.0	-	2.0
	Supportable distance m (ft)	-	300 (984)	-	300 (984)	-	300 (984)	-	300 (984)
Ethernet 10GBASE-LRM	Channel attenuation (dB)	-	1.9	-	1.9	-	1.9	-	1.9
	Supportable distance m (ft)	-	220 (720)	-	220 (720)	-	220 (720)	-	220 (720)
Ethernet 40GBASE-SR4	Channel attenuation (dB)	-	-	-	-	1.9	-	1.5 [2]	-
	Supportable distance m (ft)	-	-	-	-	100 (328)	-	150 (492)	-
Ethernet 100GBASE-SR4	Channel attenuation (dB)	-	-	-	-	1.9	-	1.9	
	Supportable distance m (ft)	-	-	-	-	70 (230)	-	100 (328)	
Ethernet 100GBASE-SR10	Channel attenuation (dB)	-	-	-	-	1.9	-	1.5 [2]	-
	Supportable distance m (ft)	-	-	-	-	100 (328)	-	150 (492)	-

As the fibre application table shows, the allowable insertion loss for high bandwidth applications is quite low. The 100GBASE-SR10 application allows just 1.5dB of total loss. To put that into perspective, the ISO/TIA standards allow a maximum loss for a connection of 0.75dB. With a connection on each side of the link totalling 1.5dB, the fibre would be allowed no loss for the link to stay within the maximum allowed by the application. This means the connection

losses need to be less than the standard allows to account for any loss in the fibre itself.

TIER 2 CERTIFICATION

Tier 2 certification adds an optical time domain reflectometer (OTDR) test to the OLTS test used for Tier 1 certification. It is not performing an OTDR test instead of an OLTS test – a common point of confusion in the industry.

An OTDR injects pulses of laser light into a fibre, then measures the time and intensity of light that is reflected back to the OTDR. Think of it as a radar for fibre. The OTDR can 'see' events on the link such as connections and splices and measure their loss. This allows the user to identify components in the link that are causing excessive loss. It can also measure the loss of the fibre itself to identify the location of bends or kinks in the cable that introduce loss into the system.

FINDING FAULT

Historically, due to their cost and complexity of operation, OTDRs were used in local area networks only to find faults in the cabling. They were not used to document a new cabling installation.

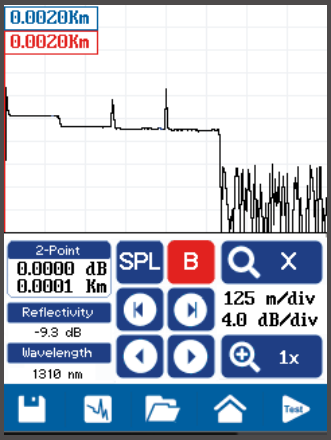
In the past 5-10 years OTDRs have become more affordable and easier to operate, allowing practical use to document any fibre installation. The benefit of Tier 2 certification with an OTDR is that each component of the fibre cabling can be tested against industry standards, providing a more comprehensive test of the system. With an OTDR report, network designers can rest assured that all of the points of failure in the cabling have been tested and meet specifications.

'While OTDR testing may prohibitively expensive a the past, that is no longe certification should be c network designer for tot

THREE OF A KIND

An OTDR result can be presented in three different ways. Traditionally a 'trace' is generated, which is a plot with the optical power on the y-axis and the distance from the OTDR on the x-axis. The trace depicts the loss of power along the length of the fibre, and an experienced user can interpret the data to identify events on the fibre and decide if the links meet specifications. When there are faults, the trace can also be used to identify their severity and location.

The second data presentation is an event table. The event table is a list of each connector, splice and section of fibre with their associated distance and loss. The event table allows the operator to quickly scan the list to check the status of each event on the link. If the OTDR allows the user to select an industry test standard, the event table will typically identify whether each event passes or fails the requirements of the standard.



The third and newest data presentation is commonly called a link map. A link map is a linear block diagram of the events on the link with a symbol that represents each connection and splice. The symbols will identify the distance and loss of each event on the link and may be colour coded to allow for quick identification

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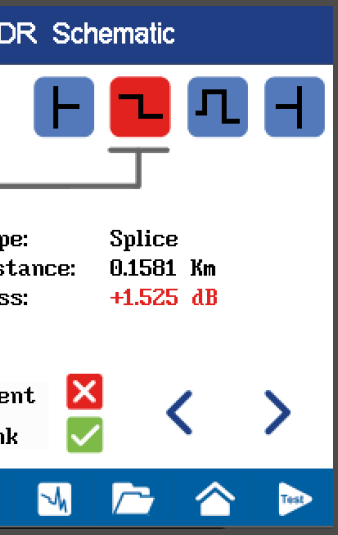
of the pass/fail status of each event. The graphical representation of the link events is easy for inexperienced OTDR users to interpret and fault location is much more intuitive compared to the trace or event table presentations.



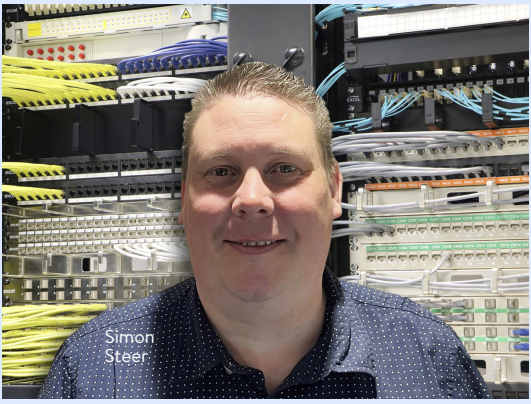
DON'T SETTLE FOR THE MINIMUM

Tier 1 certification is considered the minimum requirement by ISO and TIA standards for fibre cabling installation. A Tier 1 certification ensures that the total loss and length of the link meets the standards but it does not identify whether each component is within specifications. Tier 2 certification, by adding the OTDR measurement, provides the most thorough test of the link and can identify individual components that exceed specifications. Such insight allows the installer to correct potential failure points before the network is turned over to the owner/operator. While OTDR testing may have been prohibitively expensive and difficult in the past, that is no longer the case. Tier 2 certification should be considered by every network designer for total peace of mind. ■

DAN BARRERA

Dan Barrera is global product manager data cable testers at Trend Networks, where he manages product development, sales and marketing of the company's copper and fibre data cable and network installation and maintenance test equipment for global markets. Having been in the industry since 1997, Barrera represents Trend Networks at the Telecommunications Industry Association (TIA) TR-42 and ISO/IEC SC25/WG3 committees, developing the latest standards for copper and fibre optic cabling systems. He also enjoys technical presentations and carrying out hands-on training seminars for industry organisations such as BICSI, IBEW/NJATC and CEDIA.

Mayflex becomes a UK distributor for Pelco and appoints Rhys Jones to its security sales team



Mayflex has signed a distribution agreement with Pelco to distribute its security and surveillance technology. Pelco is a single source for video, security management and intelligent solutions, and is committed to designing and delivering a broad range of high quality, IP video security products and systems that make the world safer.

Simon Steer, security director at Mayflex, commented, 'We're really excited to bring onboard the Pelco brand and a wide selection of its range. Pelco not only focuses on product development but works tirelessly to bring the best service to its customers, offering dedicated support, support videos, storage estimators and part number guides.'

Mayflex has also appointed Rhys Jones in the role of account manager for converged technology, with an emphasis on IP security. Steer said, 'We are delighted to welcome Rhys to the team. He has great knowledge of a wide variety of access control, CCTV systems and infrastructure, which will be key to supporting our customers in his area.'

Filiz Yılmaz joins Equinix as director of interconnection EMEA

Equinix has appointed Filiz Yılmaz as director of interconnection EMEA. She is tasked with leading the interconnection growth plan for the region and identifying investment opportunities and technology trends driving the evolution of digital strategies, as businesses review their readiness for future success.

Yılmaz, based in Amsterdam, leads a team of eight business development professionals supporting companies across Europe, Middle East and Africa (EMEA) to expand their interconnection capabilities as they enhance their digital portfolios to meet evolving demand. The team works closely with customers and partners to develop joint interconnection solutions, utilising Equinix's multiple digital services.

Yılmaz said, 'I am excited to have joined this thriving company and head up the EMEA interconnection team. We are passionate about understanding customers' specific needs and evaluating the ideal interconnection solutions for them, utilising the diverse digital products and services offered by Equinix.'

Vertiv strengthens EMEA leadership team with new promotions

Vertiv has announced changes to its Europe, Middle East and Africa (EMEA) senior leadership team. The reshape of the team includes the appointment of Ana Maria Ciurea as vice president commercial operations, Peter Lambrecht as vice president sales and Rastislav Jasenovsky as vice president operations for infrastructure and solutions.


Karsten Winther

'These appointments not only align with our strategy to progress services for our EMEA customer base, but also show our commitment to our staff to advance their skills and capabilities and, in turn, opportunities,' said Karsten Winther, president for the EMEA region at Vertiv. 'With these new changes to the EMEA senior leadership team, I'm confident that we will only continue to improve satisfaction for all of Vertiv's customers in the region.'

MLL Telecom appoints two new senior solutions architects

MLL Telecom has appointed two additional senior solutions architects – Roy Harby and Mark Dulling. Harby has been in the networks and telecommunications industry for over 20 years and joins MLL with nine years' experience in a solutions architect role at Telefónica, latterly Virgin/O2. Dulling also joins MLL from Telefónica/Virgin O2, where he spent the past six years as a solutions architect.

Jeremy Wastie, MLL's head of public sector sales, commented, 'We are delighted to have Roy and Mark join MLL as senior solutions architects, who now report to Andrew Shilton, head of solutions. As the company continues its high growth path, their individual and collective expertise will undoubtedly ensure we continue to deliver true thought leadership to our customers.'


Mark Dulling


Roy Harby

CHANNEL UPDATE IN BRIEF

Westcoast has been added to Lenovo Infrastructure Solutions Group's distributors. Westcoast will give more channel partners access to Lenovo's full portfolio of servers, storage and solutions products.

Fusion IT Management has appointed James Robinson as its new chief technical officer (CTO).

Gigamon has achieved Amazon Web Services (AWS) Independent Software Vendor (ISV) Accelerate Program status as part of the AWS Partner Network (APN).

Axis Communications has committed to set company-wide emissions reduction targets in line with the Science Based Targets initiative (SBTi), which aims to drive ambitious climate action across the private sector globally.

Pax8 has announced a partnership with Nord Security, enabling Pax8 to offer online privacy and security at a global scale.

Nuvias Group is extending its collaboration with Absolute Software. Nuvias Group will access the full Absolute portfolio of solutions, from secure access to secure endpoint, enabling the ongoing shift to work from anywhere by extending the trust boundary from the endpoint to the network edge.

Providing UPS maintenance across the UK

Centiel provides comprehensive, flexible uninterruptible power supply (UPS) maintenance plans and technical support to data centres, medical facilities, the banking and finance world, as well as many other organisations across England, Wales and Scotland. The company's team of experienced engineers located around the country maintain Centiel's leading UPS solutions plus a variety of other manufacturers' equipment, subject to arrangement.


Shane Brailsford

Shane Brailsford, area sales manager at Centiel UK, comments, 'What many people don't realise is the level of flexibility we offer. The answer is yes, now what is the question? That's how we create bespoke preventative maintenance plans on behalf of our clients.'

For some sites, this means holding critical spares to avoid lead times in order to ensure the most important replacement parts are always available if needed at short notice. For other sites, Centiel can provide remote battery or UPS monitoring. This can be beneficial for clients who want to monitor the UPS and associated batteries continuously without the need for visual checks. Centiel can offer remote monitoring and real time updates via email, so clients can view the UPS and batteries on screen, as if they are in the same room.

Brailsford says, 'Our maintenance plans include 24/7/365 technical support and call out. We often find that the majority of fault calls can be resolved over the phone by our engineers, however, for those occasions where a visit to site is required, we can offer a variety of response times from four hours, six hours and even next working day for less critical sites. We always recommend at least two preventative maintenance visits per year. To minimise disruption, these can be outside of normal working hours and scheduled to fit in with other maintenance activities.'

Lifecycle reviews and health checks for legacy equipment are also available. Comparing the cost of purchasing a new UPS against the ongoing running expenses of older kit can be eye opening. Often, payback is within a few years and, armed with this information, informed decisions can be made.

Brailsford concludes, 'For us, ensuring the highest level of availability is not just about providing the best UPS systems on the market. We ensure peace of mind that that equipment will continue to be maintained for optimal performance too, and we have the flexibility to suit different site requirements.

CLICK HERE for further information about Centiel's flexible maintenance plans.

www.centiel.co.uk

Going the distance

Over the last two decades Kathryn Aves has helped shape the direction of the network infrastructure sector by championing many of the issues that have improved installation best practice. Rob Shepherd recently caught up with her to find out more about her life and career, and her thoughts on some of the big issues of the day

RS: Tell us a bit about yourself – who are you and what do you do?

KA: I'm a wife and mum of two teenagers and the managing director of Bluepoint Technologies. I originally joined on a part-time basis, as I had a small child at the time and didn't want to commit to taking on more pressure! However, I said I would give them a hand – I had previously worked within the data communications industry with various companies, so had experience to offer – and within 18 months I was working full time.

Initially, I worked on support alongside the sales team, before becoming a key account manager. When the business was sold in 2015, I was asked to become operations director. I continued to progress within the business and, when the managing director stepped up to become CEO in 2018, I was appointed managing director.

I look after the team, manage a few key accounts and liaise with existing and new customers, while working on policies and procedures. I also look for new products, services or technologies that could benefit our customers, and at how we can go about ensuring the team are properly skilled and trained.

I'm a very keen runner and have twice completed the London Marathon, raising money for Bobath Centre for Children & Adults with Cerebral Palsy. However, only one was in London! The other was around my local roads when the London Marathon went virtual due to COVID-19. This made me a Guinness World Record holder – one of 37,966 – for the most people to run a remote marathon in 24 hours.

RS: Why did you decide to embark on a career in the IT industry?

KA: Like many people I sort of fell into it! Growing up I wanted to be a police officer but the opportunities to pursue this were not easily available at the time, so I left school at 16 and started full time work doing admin in a solicitor's office.

I then joined Drake & Scull Engineering, and it was here that I found a real enjoyment for mechanical and

electrical engineering. This sent me back to college to do an HND in business and finance, which led me into the data cabling industry. I understood the industry and I enjoyed it. It's always evolving and there is always something new to get to grips with and understand. It's probably why I've been in data infrastructure ever since!

RS: What differentiates a good installation company from a not so good one?

KA: Integrity and honesty. For me, these are the biggest characteristics that define a good installer. Obviously, other considerations are also involved too – the level of professionalism and the trust that your staff has the specific skills and experience to do the job at hand.

Customer interaction is also an extremely important factor. Liaising with and, where necessary, educating the customer to ensure that they understand exactly what is being installed, and why, underpins not only a successful installation but a strong ongoing relationship. The capability to offer a high level of ongoing support to the customer is another side of a good installer.

'Looking after your people is such an enormous part of being successful. They are your business, so being there for them is important.'

RS: Does winning a contract still come down to who can do the quickest job at the lowest price?

KA: Sometimes, unfortunately, this is still the case! However, I'd like to think we can work with a customer to help them understand that lowest price isn't always the best solution. Once again, it is about education. If more than one quote is desired, then the customer needs to be sure that the quotes being compared are to the same specification.

We want to win a contract based on our abilities, our strengths, our experience, our qualifications and our reputation for excellence within the industry. For example, we won't drop our price to win a contract. The initial quote we provide, whether it's to a potential customer or a tender, is the lowest price we feel we can offer to complete the installation to the highest standards we pride ourselves on. Of course, we don't win every contract off the back of that. But we know that the lowest price and the quickest timeline might not always be the best installation, or even the cheapest, in the longer-term.

RS: Is training and skills development given enough consideration by installers?

KA: Training and qualifications are very much at the forefront right now.

As an industry we have recognised training organisations and I believe that all good installers are making significant investments to ensure their levels of training and qualifications are up to scratch. The industry recognised training providers are also taking a leading role in driving improvements, such as striving to ensure that necessary qualifications are included in tenders. This can play a big role in protecting end users.

There are still gaps in the industry where that protection is falling by the wayside, but I think things will keep improving. It is vital that we continue to implement the necessary regulations and procedures to ensure appropriately trained installers are undertaking every data installation.

'I'm sure there have been occasions when I've met a customer or supplier who wasn't expecting to meet a female, but I have relished any opportunity to challenge perceptions and create a positive impression of women in the industry.'

RS: Has being a woman in what is traditionally a male dominated sector created any particular challenges for you?

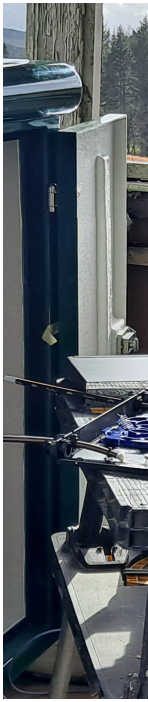
KA: I've only ever been met with positivity, so I don't think it has created challenges. In some ways, it has actually opened doors for me. I think I've been welcomed in certain areas, more so than a man, because it's a breath of fresh air for some people.

I'm sure there have been occasions when I've met a customer or supplier who wasn't expecting to meet a female, but I have relished any opportunity to challenge perceptions and create a positive impression of women in the industry.

RS: Is enough being done to encourage more women to have science, technology, engineering and mathematics (STEM) based careers and, if not, what would you like to see happening?

KA: If you read the reports coming out of organisations like The Education Hub, you can see that a growing number of women and girls are pursuing careers in STEM influenced industries.

The gender gap is closing at the education stage – the important thing is for the industry to ensure that the career opportunities are there to build on this growth. We currently have a female apprentice in our team of engineers who is due to complete her apprenticeship later this year. Having more females as role models in the industry can only be a positive in terms of sustaining an increase. It comes down to personal career choices, but I firmly believe that any woman who has the desire to succeed in the sector will find the opportunities to do so.



RS: How do you predict the network infrastructure industry developing over the next five years?

KA: I think we will see two key changes. The first is the evolution in data demands, largely due to the long-term changes to

working habits kickstarted by COVID-19. The second, which will have far more impact and significance for our industry, is a bigger swing towards sustainability.

The pandemic forced a dramatic evolution in technology, with homes across the world being transformed into regular workplaces. Of course, the work from home boom has meant that homes now require better data infrastructure, leading to growth and variance in connectivity demands.

However, the issue that will affect our industry day to day is sustainability. We are all factoring in carbon embodiment to work out the carbon status, and overall sustainability, of every install. As installers, we must be prepared to embrace the potential for improvements in sustainability throughout every stage of each install – from the sourcing of products and equipment to installation and aftercare.

The growing body of carbon embodiment data throughout the industry makes it possible for us to estimate the true carbon cost of each aspect of our delivery, and the quality of data is only going to improve. By embracing this, installers have the capability to support end users in their sustainability goals – whether they be residential, private or commercial.

RS: What's the best piece of advice you've been given and how has it helped you during your career?

KA: Always value your team. Looking after your people is such an enormous part of being successful. They are your business, so being there for them is important. Those times when you go the extra mile to show you care about your people are the moments when you create loyalty.

Be confident, but do the work required to ensure you don't stray into arrogance. If you know for a fact that you are right – if you've done your homework, done your research and are totally sure of your figures – you need to be sure of yourself when putting your point across.

Be honest and, finally, always put a smile on your face! ■

Quick clicks

Your one click guide to the very best industry events, webinars, electronic literature, white papers, blogs and videos

Demand And Speculation Fuel Edge Buildout is a report from **Uptime Institute** that looks at how the complexity of edge business cases and other factors threaten to suppress demand. **CLICK HERE** to obtain a copy.

Repatriating And Digitally Transforming Enterprise Data Centers is a white paper authored by Gary Bernstein of **Siemon.** **CLICK HERE** to read it.

Steps To Success With Wi-Fi 6/6E is a technical guide from **NetAlly.** **CLICK HERE** to download a copy.

Three Steps MTDC Providers Can Take To Reduce Energy Expenses is blog by Jeff Paliga of **Panduit.** **CLICK HERE** to read it.

Throw Away the Key: Our Passwordless Future is a survey report from **Ping Identity** and **Yubico.** **CLICK HERE** to read it.

Verizon's 2022 Data Breach Investigations Report contains an analysis of over 23,000 incidents and 5,200 confirmed breaches. **CLICK HERE** to download a copy.

Data Driven Infrastructure Within Healthcare is a webinar from **Siemon** and **Arista Networks** that examines the current trends, technologies and standards that IT professionals in the healthcare industry need to be aware of when implementing a new network infrastructure. **CLICK HERE** to view it.

Go with the flow

Jason Matteson of Iceotope explains why it is essential that edge data centre designers focus on the precision liquid cooling of equipment

Organisations and their users need new digital infrastructure to process the massively growing amounts of data being generated. However, the growing acceptance that human activity is negatively impacting climate change means that infrastructure must have as little effect as possible on the environment, while also extending a system's operational lifetime.

GROWING CONCERN

This data explosion continues to provide challenges for the enterprise. Data, artificial intelligence (AI) and machine learning are all rapidly becoming intertwined. AI is fed by data and making sense of data requires AI. Gartner predicts that 75 per cent of enterprise generated data will be created and processed outside a traditional centralised data center or cloud by 2025. This massive growth in edge networks, while adding to available compute, will not diminish data centre construction.

To cope with that level of change, our industry must create the platform to support low latency, dense compute capabilities within edge data centres. These platforms need to offer at least the same server

resiliency and serviceability seen in larger scale sites if the expansion at the edge is to be effective and offer positive effect on climate management by increasing energy efficiency.

NEW APPROACH

Being edge ready needs to be about sustainability as much as being operationally resilient. New thinking and truly sustainable solutions are being developed or reengineered for the harsh environments of edge locations. It won't suffice to take a solution developed for inside the data centre, tweak it and then place it at the edge. Solutions will come to market to test the parameters, and many will not be successful as they have not used the right types of electronics or chips, or didn't do something as simple as using conformal coating to protect the server boards in otherwise exposed environments.

A clear solution to edge server and other rack based electronics design is chassis level precision liquid cooling. There are several variant solutions that address edge conditions and most offer a sealed chassis that creates a controlled environment that is impervious to dust, gases and humidity – an essential requirement for smaller remote sites where costs will not allow clean space conditions.

These solutions also maintain data centre compute density while offering improved energy efficiency. This allows high speed, higher processing power servers to be efficiently cooled by liquid compared to the inefficiency of air cooling systems. Sealed chassis servers also ensure that external environmental factors do not affect the compute capability of the edge system. A further sustainability benefit is the drastic reduction in water consumption required for liquid cooling compared to air cooling techniques.

DRIVING FORCE

Autonomous vehicles are often cited as drivers for high performance compute (HPC) at the edge. This is for a good reason, as they are constantly generating data for predictive analytics and search patterns to keep drivers safe on the road. In a split second, the data needs to be filtered, analysed and moved. When a vehicle is analysing data to predict if an accident is about to happen, latency becomes a critical issue and the delay to a centralised data centre may be too long. The infrastructure needs to support the speeds and feeds of the data being generated otherwise it could result in a very serious problem.

Consider, as well, the retail environment. Real time data is used to improve the in-store customer experience. However, the equipment and servers that are needed for that capability have to be in a form factor suited for a retail environment. Floorspace is a premium asset and any computing device reducing floor displays or stock room footprint will cost the retailer money.

Liquid cooled compute solutions are in form factors identical to air cooled servers. They offer the benefit of greatly increased compute density in similar footprints, without the requirement for additional expensive air cooling systems. In this

‘A clear solution to edge server and other rack based electronics design is chassis level precision liquid cooling. There are several variant solutions that address edge conditions and most offer a sealed chassis that creates a controlled environment that is impervious to dust, gases and humidity.’

situation liquid cooling also eliminates the need for server fans and reduces noise and vibration associated with air cooling fans in servers.

MAKING A MOVE

As the move to the internet of things (IoT) and edge computing continues, colocation is becoming an option for organisations who don’t want to manage hundreds of distribution points. However, it is also likely to be a point of disruption for AI.

Colocation facilities were designed for legacy, non-compute intensive applications at 5-8kW per rack. If multiple tenants are deploying AI and machine learning applications at 20+kWh per rack, power and cooling limitations within the data centre are quickly maxed out, with the potential to overload the power or cooling at peak compute periods. Precision liquid cooling is a solution that increases the cooling potential over a wider temperature range and is suited to high performance computing environments.

SOLUTION PROVIDER

As an industry, we have developed solutions to address these issues in the data centre itself. Over the last couple of decades there have been many studies addressing data centre energy consumption. Massive moves on energy savings have been made by focusing on best practices for optimising energy and developing newer technologies to increase capabilities for the same energy use.

The shift to the edge will, however, disrupt these efforts. The economies of scale for infrastructure and solutions in a centralised data centre will not be easily reproduced at the expanding edge, if at all. The question becomes how do you maintain data centre density and improved energy efficiency to help

climate management, while bridging the need for ruggedised compute intensive equipment required for the edge?

TOUCH TALK

Edge locations contend with a variety of harsh IT environments, from extreme cold and damp to heat and humidity. There are also airborne contaminants, particles and corrosive gasses to be aware of – all of which need to be closely monitored to not impact the servers regardless of their location.

ASHRAE outlines key considerations for the reliable operation of servers and equipment in edge locations. These range from checking IT specifications in order to understand the impact to equipment warranties, servicing capability, corrosion limits, and the impact of air and temperature on equipment. New standards are likely to evolve as we see more deployments in unusual locations from utility towers, streetlight poles or even in vaults beneath the pavement.

TIME FOR ACTION

Data, AI and machine learning are becoming ubiquitous across most industries all over the world. It is time for organisations to consider and act on cooling and climate management in their edge transition plans. Recent global events have dramatically affected how we spend our work and leisure time, and the digital infrastructure is adapting to accommodate these changes. With the right preparation, organisations will be able to capitalise on the real time insights and create greater value for their business while helping to sustain our planet. ■

JASON MATTESON

Jason Matteson is director of product strategy at Iceotope. His 25 year career in technology has spanned companies such as IBM, Lenovo and Vertiv, before joining Iceotope in 2020. Matteson's role is to drive the product roadmap in the precision immersion cooling marketspace, where his experience across enterprise and data centre environments is essential. His skillsets are demonstrated through two consecutive tenures (2015-2019) as ASHRAE TC9.9 vice chair and chair.

EDP Europe

Aisle containment, as part of an airflow and thermal management strategy, improves cooling optimisation and thermal performance, delivering potential energy efficiency gains at computer room air conditioning (CRAC) unit level.

EDP Europe provides various hot and cold aisle containment solutions – from custom engineered systems that attach to the fabric of a data centre to the AisleLok out of the box solution that can be installed simply in minutes. EDP Europe's custom solutions are fully flexible, tailor-made and effective, and can be utilised in new build projects or retrofitted within legacy environments.

Independent of cabinet manufacturer, EDP Europe's hot and cold aisle containment HAC & CAC solutions can be designed to fit any configuration of rack heights and widths, accommodate overhead services, structural columns and all other possible variations in a data hall. EDP Europe offers a range of door, infill and roof options including FM Global approved panels.

CLICK HERE to find out more, call our sales team on 01376 501337 or **CLICK HERE** to send us an email.

www.edpeurope.com

Rittal

Rittal is expanding its smart cooling unit solutions with the new Blue e+ S range. This latest generation of cooling units with lower output categories of 300W, 500W and 1,000W has been designed for efficiency, ensuring a smaller footprint and lower costs.

Blue e+ S offers innovative energy saving features for the production process. What's behind this is the technology used, combining a heat pipe with inverter controlled components. The heat pipe works without a compressor, expansion valve or other regulating elements and does not need any electrical energy except to operate the fan. Depending on the thermal energy generated in the enclosure and the current ambient temperature, cooling can be performed with the heat pipe alone.

The additional compressor cooling only operates if a large amount of heat has to be dissipated from the enclosure or if the ambient temperature is very high. And what's more – when it does operate, it is far more energy efficient than conventional units. This is because the compressor and fans possess an inverter controlled drive, which automatically adjusts their speeds depending on the requirements.

To find out more **CLICK HERE.**

www.rittal.co.uk

Schneider Electric

Schneider Electric's range of Uniflair chillers provides the efficiency, precision and configurability to adapt to current and future data centre cooling challenges. The air cooled and free cooling extra-large chillers provide increased cooling capacity and lower power consumption for high energy efficiency in all environmental conditions.

Schneider's latest 300-2200kW Uniflair chillers introduce major improvements to high efficiency and reliable cooling for data centre applications and enhance the current platform with new sizes and configurations. The chillers:

- Offer modular configuration and are packaged to simplify and accelerate site deployment and design.
- Integrate a free cooling system that leverages outdoor air to provide cooling, minimising energy consumption without impacting unit size.
- Minimise annual energy usage, improving total cost of ownership.
- Achieve +2MW with high water temperature, increasing unit cooling capacity in a reduced footprint.

For more information **CLICK HERE.**
www.se.com

Panduit

SmartZone Cloud is Panduit's enhanced Microsoft Azure cloud based enterprise data centre infrastructure management (DCIM) software. It integrates power and environmental monitoring with cabinet access, asset tracking and physical infrastructure connectivity management. Data centre managers, engineers, operators and customers can monitor critical infrastructure resources and make informed decisions about capacity, changing environmental conditions and performance from any authorised device and via unlimited users worldwide.

Providing single pane of glass dashboard visualisation is a vital step towards improved data centre agility and increased efficiency. The capability to track critical infrastructure resources helps stakeholders achieve service level agreements (SLAs) and allows customer defined users access to SmartZone Cloud's real time monitoring, management and reporting of key attributes across assets, power, cooling and provisioning.

To find out more **CLICK HERE.**
www.panduit.com

In the cold light of day

Steve Lorimer of Keysource explains why liquid cooling is much more effective at removing heat than air cooling – but might not be for everyone

It is estimated that the data centre sector accounts for between 1-2 per cent of all global electricity usage. As such, there is continued political, economic and pressure for operators to be more efficient and sustainable.

TAKE AWAY

IT aside, the vast majority of this power usage is due to cooling within the data centre and the need to relocate heat away from central processing units (CPU). Traditionally, air cooling is the go-to solution and makes up the vast majority of cooling solutions in the data centre world. Existing air cooling systems are usually firmly embedded into the physical infrastructure of a data centre, are largely effective and still the best option for 60-70 per cent of set-ups.

However, a growing number of organisations are looking at the option of liquid cooling solutions, either as an alternative or as a complementary element. The reason is simple – liquid cooling is much more effective at removing heat than air cooling.

To put this into context, currently air cooling has 60kW per rack limitation, direct liquid cooling 70kW per rack limitation and full immersion/fan-less liquid cooling 120kW per rack limitations. This is important, as we are seeing rack densities continue to increase, driven by consumer demands for faster and more complex services in certain applications. However, it is also fair to say that alternative cooling methods don't need to exclusively sit with high performance computing (HPC).

WHAT'S THE DIFFERENCE?

Although both air and liquid solutions meet the objective of absorbing heat from a CPU, the processes for them are worlds apart. Most air cooling systems take in cold air via the front of the unit and then exhaust hot air from the back. In the hot aisle/cold aisle arrangement the rows of server racks are oriented so that the server fronts face each other in one row and the server backs face each other in another row. Cold supply air is then delivered directly to each cold aisle and can be matched to the server airflow requirements for maximum efficiency.

A direct liquid cooling system circulates a liquid through a heat sink attached to the processor. As the liquid passes through the heat sink, heat is transferred from the hot processor to the cooler liquid. The high specific heat capacity of the cooling liquid means it is much more effective than air at removing heat, enabling higher densities to be achieved.

Finally, immersion cooling involves complete servers being submerged into a thermally conductive dielectric liquid or coolant. Heat is removed from the system by circulating liquid into direct contact with hot components, then through cool heat exchangers. Fluids suitable for immersion cooling have very good insulating

'A growing number of organisations are looking at the option of liquid cooling solutions, either as an alternative or as a complementary element. The reason is simple – liquid cooling is much more effective at removing heat than air cooling.'

properties to ensure that they can safely come into contact with energised electronic components.

LIQUID ASSET

In simple terms, a liquid cooled system opens the door to more efficient heat rejection, resulting in environmental benefits including improved power usage, reduced emissions and waste. The higher grade of heat rejected (70°C+) compared to air systems (<40°C) also opens the doors to heat reuse/recovery opportunities through symbiotic relationships with industries that require continuous hot water for their industrial processes. It also produces less noise than air cooling.

The increased coolant supply and return temperatures mean that full cooling is possible without the need for chillers and, in most UK cases, without adiabatic cooling. This can mean a lower cost to deploy and maintain cooling infrastructure. In addition, the stranded electrical capacity reserved normally for chiller use could be repurposed into additional IT capacity.

HORSES FOR COURSES

The physical space requirements and layout of a facility that is liquid cooled can require a different type of data centre design than an air cooled facility. This means that for many legacy data centres the addition of liquid cooling may not be a realistic option. In addition, not everyone needs the IT systems that require direct liquid cooling – air cooled servers can be more than adequate and may represent a lower total cost of ownership, for now. For many facilities it may not always be possible to implement wholesale changes in a live environment with inherent space, power and environmental constraints.

However, many hyperscale cloud operators such as Alibaba, Google, Amazon, Apple, Baidu, Microsoft and Oracle

are reportedly already investing in this technology since they need to address their HPC applications along with their artificial intelligence customer demands. Colocation operators that are also competing in the HPC sector and attracting hyperscale cloud clients are allocating raised floor areas dedicated to liquid cooling racks.

Liquid cooling could play a much bigger role in helping companies meet their sustainability based targets. Reducing the carbon and energy footprint of an operation and reusing hot water to help unrelated industries meet their sustainability initiatives are just two of the obvious benefits of a liquid cooling solution. And though the scale of changing from air cooling to liquid cooling might be too off-putting for leaders within the date centre sector today, it might well become more of a pressing issue as the task of saving energy on a significant scale starts to become more apparent during the next few years.

ON THE UP

We are seeing a growing uptake of liquid cooling solutions for the next generation of HPC in specialist institutions and universities and, in many cases, existing users are adapting existing air cooled rooms with chilled water infrastructure to address small scale deployments. This can provide a good opportunity to reuse or supplement existing free cooling chiller capability and to further optimise existing air cooled systems and infrastructure. So, whilst uptake is steady and we do not expect a widespread commercial shift from an air cooled system to liquid cooling in the near future, it is becoming increasingly relevant. ■

STEPHEN LORIMER

Stephen Lorimer is group technical director at Keysource, supporting its advisory and strategic consultancy offering. His technical capability and experience in data centre development, design and operations provides Keysource's customers with invaluable insight.

Keele University chooses Vertiv for energy efficient data centre power protection

Vertiv has been selected by Keele University to supply a highly energy efficient uninterruptible power supply (UPS) system and battery back-up. The new solutions replace the ageing equipment in its data centres, and Vertiv expects it will play an important role in Keele University's decarbonisation strategy.

From a power distribution perspective, the campus operates like a small town. Keele University's need was to minimise losses as energy is transferred from the grid to the UPS and on to the IT load, and to benefit from a new generation of batteries.

With this new agreement, Vertiv will replace Keele University's ageing UPS with a new scalable, efficient and space-saving solution. Vertiv will also provide a modular battery solution to help keep power supplies stable during outages and out of spec power input, allowing efficient management of the renewable energy produced on-site.

Proximity opens Bristol edge colocation data centre

Proximity Data Centres has opened its latest facility – Proximity Edge 9 – which will serve users in and around Bristol, as well as throughout the South West and Wales. Built on a 3.4 acre site with easy access to Bristol and the M5/M4 motorways, Proximity Edge 9 has excellent power, cooling and security features. The 90,000ft² facility is built to Tier 3 standards, has 4MW of IT capacity, including 1MW of white space, and the potential to expand to 20MW.

It is ideally positioned to support one of the UK's largest regional edge markets including a rapidly growing technology sector with best in class colocation services and excellent low latency connectivity solutions. Full on-site support, transition and onboarding is provided, along with server migration services and a straightforward contract with a single set of service level agreements (SLAs) covering one or multiple sites. ISO 9001, ISO 14001 and ISO 27001 compliant, all Proximity's data centre grid electricity is sourced from 100 per cent renewable providers.

Vantage Data Centers opens Johannesburg campus

Vantage Data Centers has announced the delivery of the first facility on its Johannesburg campus – JNB11. The two-storey facility offers 16MW of critical IT capacity across 12,000m². The project was delivered in 10 months, 10 days ahead of schedule, with zero lost time incidents over 1.5 million working hours.

With an investment totalling more than $1bn, Vantage's 30 acre campus will include 80MW of IT capacity and more than 60,000m² across three data centres once fully developed. Located in Waterfall City, the campus complements the area's thriving data centre ecosystem and leverages its optical fibre connectivity to the rest of Africa.

In addition, the campus aligns with the company's commitment to sustainability, offering renewable energy options, limiting carbon emissions and maintaining energy efficient operations with an industry leading Power Usage Effectiveness (PUE). In June, Vantage announced it had entered a 20 year power purchase agreement (PPA) with SolarAfrica to support the production of 87MWp of renewable energy to supplement the local grid that powers the campus.

PROJECTS & CONTRACTS IN BRIEF

Cologix has continued its strategic partnership with Console Connect by deploying the Console Connect Software Defined Interconnection platform at its TOR1 data centre in Toronto.

Colchester is the latest city to get superfast fibre connectivity with an innovative FTTX system using Prysmian's 552 Sirocco HD fibre cable.

NTT Data Italia has formed a strategic partnership with Cogniac Corporation. The partnership will implement Cogniac's proprietary visual data processing platform to support NTT Data's manufacturing operations and critically enhance its smart factory capabilities in Italy.

Ancoris has formed a partnership with the University of Exeter, offering support as it embarks on a strategy to create a seamless digital experience for students.

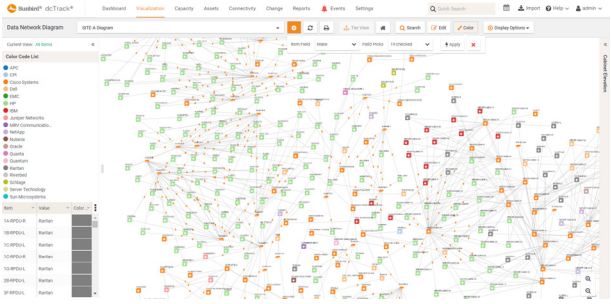
The Grid Factory has selected Proximity Data Centres' facility in Swindon to support its platform for delivering virtual and augmented reality experiences.

Sunbird Software

Sunbird Software has expanded the automation via integration capabilities of its second generation DCIM software with a new ticketing connector. Customers with ticketing applications such as ServiceNow or Jira can now automatically push tickets to dcTrack to initiate the workflow process.

Tickets can also be automatically updated from dcTrack. For example, tickets can be automatically closed when the work is complete. The connector can be configured to integrate with most ticketing applications with the appropriate application programming interfaces (APIs).

Also new in dcTrack is a network diagram feature that allows customers to visualise their entire data network and decrease troubleshooting time. Customers can view networks in tiered or mesh mode, customise nodes as shapes, icons or model images and search, filter and colour code



their network. Sunbird makes it easy to visualise what's connected to what across both active and passive network components, and across all sites.

CLICK HERE to schedule a demo.
www.sunbirddcim.com

HellermannTyton

HellermannTyton provides a complete range of multi-dwelling unit (MDU) solutions designed for the smallest of properties, the largest of properties and everything in-between.

HellermannTyton's full range of MDU optical fibre distribution enclosures adds strength, flexibility and multiple options to its FTTX product portfolio. The extended range of MDU enclosures offers a full end to end last mile fibre solution, providing installers, engineers and network designers with a wide choice of product to suit their fibre project.

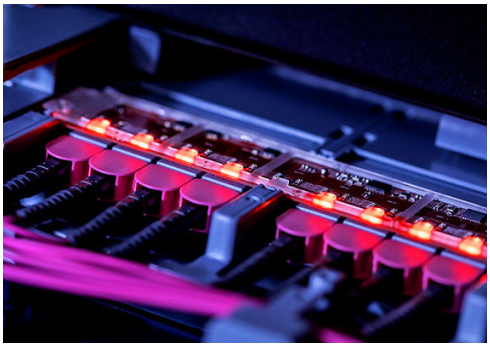
The full MDU S comprises six fibre enclosures, each offering different options depending on the building and the network design. The largest S5 option presents capacity and pre-connectorisation, meaning high fibre count installs can be completed quicker and easier.

The S4 and S3 are the mid-range options and can be either connectorised or splice only, accommodating up to 240 fibres (S4) or 96 fibres (S3). The S2, S1 and S1XS are perfect for the smaller install, offering up to 24 fibres (S2) or 12 fibres (S1 and S1XS).

To find out more **CLICK HERE.**
www.htdata.co.uk

R&M

The packing density of R&M's fibre optic distribution platforms – Netscale 72 and Netscale 48 – can now be tripled, which allows data centres to use available space even more efficiently.



High density distributor, Netscale 72, and mixed media distributor, Netscale 48, trays can be equipped with CS, SN and MDC connector types. Despite the high port density, network technicians can easily plug in and unplug patch cords with these very small form factor (VSFF) connectors. This enables data centres to triple the number of connections per height unit in 19-inch racks, compared to using LC connectors.

R&M emphasises that this represents a fundamental optimisation of the ratio of cost and surface area. For example, it can set up four channels per module to create links with 4x100Gb/s or 4x400Gb/s. Such solutions will be in demand for the upcoming migration to 400 Gigabit Ethernet networks.

For more information **CLICK HERE.**
www.rdm.com

All you need to know

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First class honours

University Technical College (UTC) Heathrow is a science, technology, engineering and mathematics (STEM) focused school for students aged 14-19. Andrew Stevens of CNet Training tells the story of how it was created and what it aims to achieve for the digital infrastructure sector

In my 26 years with CNet Training, there has always been a strong commitment to creating a legacy for the digital infrastructure industry. One of the most important aspects of my role as CEO of the company is our push to inspire new generations to think of the industry as a viable career choice.

TIME FOR ACTION

As most of us are aware, the digital infrastructure industry has a critical skills shortage that is only set to continue – something, somewhere and somehow, needs to be done to address this. For many years I have had the same conversations with leaders across the industry and we all agree that something needs to change but, sadly, nothing ever does.

Several years ago I met Bob Noseda on the back of the work CNet Training had done at the London 2012 Olympic and Paralympic Games. We took local unemployed people, trained them to install copper and optical fibre cabling and then found them work. Our combined view was to 'start from the bottom' – engaging with schools, promoting STEM subjects and explaining the opportunities on offer.

CLOSE TO THE EDGE

I soon became a trustee of the Edge Foundation – an independent body working to inspire the education system – and through this I met Lord Baker, a former Secretary of State for Education, and chairman of the Baker Dearing Educational Trust, which promotes and develops UTCs. Lord Baker turned me to the concept of a UTC and the key elements behind it.

For a UTC to be created, there has to be a partnership between a university, a new school and employment partners. Typically, UTCs are new builds – the government will give circa £10m to construct it and the

> ‘Quite simply, there is no good reason why you wouldn’t want to contribute to changing the industry and building a steady and ongoing pipeline of talented individuals to join it.’

university will give up some land to build it on. There are now 48 UTCs across the UK.

Lord Baker was particularly interested in the data centre industry and the possibility of a chance to create a UTC in Slough occurred. I spoke to a data centre organisation about this, they were interested, this was fed back to Lord Baker and we set the ball rolling. Unfortunately, after a series of meetings, the organisation decided they wanted to do it on their own, so it was a no-go for UTC Slough.

ONWARDS AND UPWARDS

I spent a few more years speaking to individual data centre providers, introducing and promoting the concept of UTCs, and always looked for genuine interest in helping to establish a dedicated data centre UTC. Eventually, through the Baker Dearing Educational Trust, I met Mike Halliday, head of employer engagement strategy at the Activate Learning Education Trust (ALET).

Mike picked up on some previous meeting notes and, by coincidence, we were introduced to each other. He was very interested in learning more about the digital infrastructure sector, so I briefed him and we got to the point where we both agreed we should try and do something. At this point we didn’t quite know how we could get this off the ground, as the Baker Dearing Trust doesn’t have endless resources and interest from the industry was still lukewarm.

And then the coronavirus pandemic happened. The UTC in Heathrow hit the buffers because it was an aviation and engineering UTC, and in the early months of 2020 we didn’t quite know when we would be flying again. Mike came to me and said rather than build one, we could work with an existing UTC.

A NEW APPROACH

It became clear to me that I was knocking on people’s doors as CNet Training, and while people were kind and polite enough to listen to me, they didn’t really understand the concept. Many of them inadvertently thought I was trying to sell them technical education programs. However, I was still confident that we could get people on board.

By this time it was starting to look like a real possibility. We had some interest and people started to love the idea, but we needed some partners. The whole thing about UTCs is industry collaboration – some potential partners would ask who else was involved, which led to some reluctance, clearly because some companies didn’t want to work with others. However, that stopped very quickly once they understood that they would actually be working to change the future of the digital infrastructure industry. I am pleased to say we very quickly got a number of partners to commit.

The key to it was always managing the expectations of the partners and explaining how much we needed from them in terms of costs and time investment. The annual fee of £12,000 that each party pays is an irrelevance – no one was concerned about it. They were more

concerned about the UTC working and not creating a huge workload for them. The UTC Heathrow founding partners are CNet Training, Virtus Data Centres, CyrusOne, CBRE, Amazon Web Services (AWS), LMG, Ark Data Centres and Yondr.

WHY NOT?

I didn't ask people why they would get involved in the project, I asked them why they wouldn't want to be involved. Quite simply, there is no good reason why you wouldn't want to contribute to changing the industry and building a steady and ongoing pipeline of talented individuals to join it. My view was that this had to happen – it's good for our industry and if we don't do this, we simply won't solve the talent problem.

When I mentioned that there will be 150 data centre engineering students leaving UTC Heathrow every year they started to see this as an investment in the future of the sector. 150 data centre engineering students each year is a good number, but it is not going to solve the problem of the apparent 300,000 new recruits that we need. The key here is that the

model can be replicated – we've already had indications that other UTCs would be interested in adding a data centre curriculum to their portfolio, and that is very exciting.

If we can get three UTCs, suddenly you have 450 new recruits entering the industry in different roles every year. Plus, think about the newfound awareness around data centres as a result of UTC Heathrow. Suddenly you are talking to 2,000 people a year who will now know about data centres.

BIGGER PICTURE

I am pleased that the message is starting to be spread. It really is so important that the digital infrastructure industry becomes a destination of choice for an exciting career – it's diverse, it's inclusive, it's global and it's well paid. The fact is, the industry is growing and we need people to support it.

No-one knows exactly what the industry will look like in 5-10 years' time. There will be more devices, not less, and computing will be required more and more. We need to stop worrying about what the long-term future will hold. We should worry more about the talent and skill sets needed. If we don't talk to young people about the industry, and in their language and not ours, they won't know. Youngsters are motivated and driven but they learn differently now. So, we all need to talk with them, not present to them, take their questions and engage with them.

UTC Heathrow recently won the Education and Employment Project Award at the Datacloud Global Awards 2022. This is one award that I really feel proud of because of the collaboration between the partners – they all worked so well together. It's broken down industry barriers and its shown what we can do when we genuinely work together, but leave our own business at the door.

NEXT STEPS

One of the most fulfilling aspects of it all is how much the representatives of the partners have got out of it, not just the students. Even within CNet Training, people who have been involved in the project love it. It's challenging for them – they've not stood in a classroom and delivered a workshop with 14 year olds for a long time, if at all! Everyone who is involved with it is learning, giving back, and they are being enhanced themselves. For an industry that can appear 'invisible', we now have something tangible to look at, and we know that what we are doing is well worthwhile. ■

ANDREW STEVENS

Andrew Stevens is president and CEO at CNet Training. He has been involved in the international telecommunications and data centre industries for the past 34 years, starting his career within the manufacturing and distribution arenas. Stevens has been an active member of numerous industry trade bodies and has also been awarded a number of industry accolades for his work.

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